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Extra rectrices in Olivaceous Cormorants *Phalacrocorax olivaceus*

by Douglas Siegel-Causey

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Abnormal numbers of tail feathers in birds occur infrequently, but the phenomenon has been observed in many orders and families (see Somadikarta 1984, Hanmer 1985, and Saini & Toor in this issue). Unlike in passerines, where abnormalities most often involve a reduction in number, in non-passerines the pattern seems to be of supernumerary rectrices (Hanmer 1985: Table 1). Although extra rectrices are known for many anseriform, charadriiform, and galliform species (Melville 1985), there are few reports of abnormal numbers in the Pelecaniformes; Broekhuizen & Liversidge (1954), for example, found no abnormalities in rectrix number in a sample of c. 3700 Cape Gannets *Morus capensis*. During the course of a family-wide survey of the Phalacrocoracidae, I had the opportunity to examine tail moult in 1272 individuals in 7 species, in both museum collections and field specimens.

All except 14 (1.02%) of the cormorants and shags had the normal number of rectrices, which is 12 except for the Red-legged Shag *Phalacrocorax gaimardi*, which has 14. None of the 14 had a reduced number, and all but one were Olivaceous Cormorants *Phalacrocorax olivaceus* (Table 1), each of which had 2 extra tail feathers; a few appeared

TABLE 1
Specimens examined and frequency of occurrence of extra tail feathers in
Phalacrocoracidae.

Species	No. of rectrices	Deviation from normal rectrix number (No. individuals)		
		None	+1	+2
Brandt's Cormorant				
<i>Phalacrocorax penicillatus</i>	12	41	0	0
Double-crested Cormorant				
<i>Phalacrocorax auritus</i>	12	280	0	0
Olivaceous Cormorant				
<i>Phalacrocorax olivaceus</i>	12	390	0	13
Blue-eyed Shag				
<i>Phalacrocorax atriceps</i>	12	108	0	0
New Zealand Shags				
<i>Phalacrocorax carunculatus</i> s.l.	12	121	0	0
Rock Shag				
<i>Phalacrocorax magellanicus</i>	12	110	0	0
Pelagic Shag				
<i>Phalacrocorax pelagicus</i>	12	139	1	0
Red-faced Shag				
<i>Phalacrocorax urile</i>	12	13	0	0
Red-legged Shag				
<i>Phalacrocorax gaimardi</i>	14	58	0	0

to have only one, but more careful examination usually revealed evidence of a recently moulted feather. Wetmore (1926) reported an Olivaceous Cormorant in the Museum of Vertebrate Zoology, Berkeley, collected from western Argentina as having 13 tail feathers; but closer examination of this specimen (MVZ 42836) revealed the presence of a newly emerged feather bud opposite the side with the extra feather. Tail moult in the Phalacrocoracidae is complex and frequently asymmetrical (Stresemann & Stresemann 1966), and obtaining a correct count of rectrices in museum skins can be difficult, especially when many feathers have been lost. Some specimens, for example, collected in the field had only 3 visible tail feathers; the rest had just moulted or were budding.

The geographic distribution of Olivaceous Cormorants with 12 and 14 rectrices throughout South America is shown in Figure 1. Not shown are 17 specimens from Central America and 62 from Mexico and the United States, all of which had 12 rectrices. Individuals with supernumary tail feathers were restricted to the southwestern part of South America, 3 of them from a single locality, Islas Chinchas, Peru (13°39'S, 76°25'W) (Fig. 1).

The frequency of occurrence of extra tail feathers in Olivaceous Cormorants is about half that seen in some other non-passerines, but is the highest so far observed in the Pelecaniformes. It is difficult to compare these results accurately with other observations (cf. Cramp & Simmons 1977, Somadikarta 1984, Hanmer 1985, Melville 1985, etc.) because the dates of collection of the specimens I examined spanned a century, and the proportion of individuals with extra tail feathers in the entire population at any one time may be insignificant considering the period of time

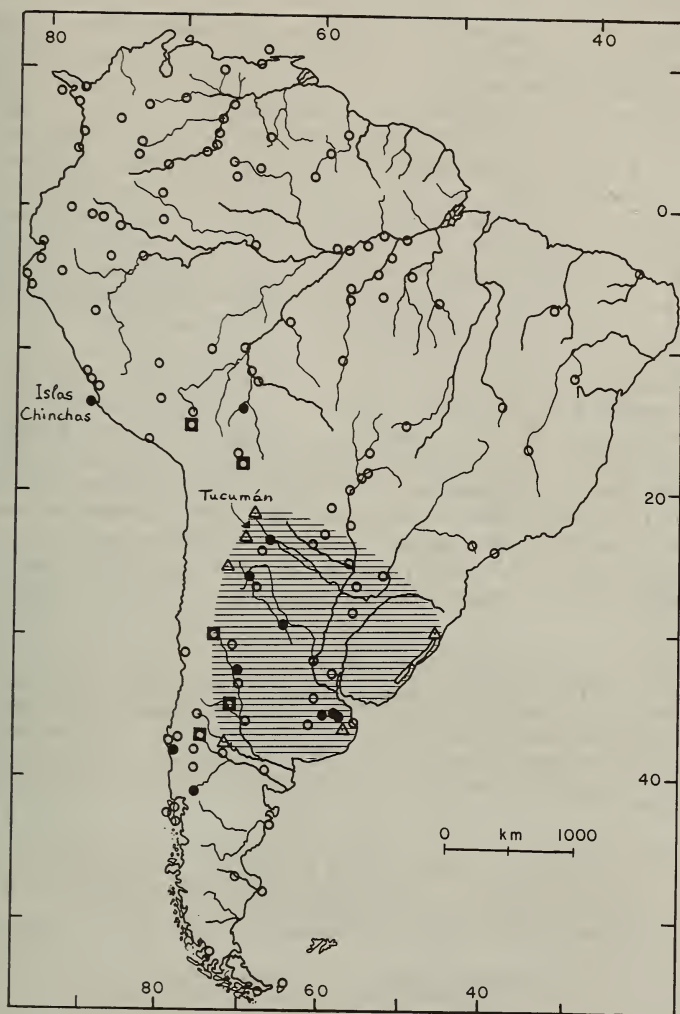


Figure 1. South American specimens of Olivaceous Cormorants *Phalacrocorax olivaceus*. Open circles are birds with 12 rectrices; dark circles are those with 14; open black squares are birds with blue irides. Triangles are ringed birds recovered at the extreme limits of the area of observed dispersal (shaded) from the ringing site at Tucumán.

during which the specimens were collected. This, however, does not affect the geographically localized nature of the phenomenon, nor its disproportionate occurrence in Olivaceous Cormorants.

In the only ringing study published on South American Olivaceous Cormorants, Olrog (1975) found that individuals marked in Tucumán, northern Argentina (Fig. 1) dispersed primarily to the southeast along

drainages of the Paraná River. None appeared in the north or northeast; but these regions of the Chaco and Mato Grosso are sparsely inhabited and by people unlikely to report ring recoveries. There is some evidence that Olivaceous Cormorants from the southern 'cone' of South America have minimal contact with populations north and east of the boundary ranges of the Amazonian Basin (unpubl. data). Further support for a distinct southern population of Olivaceous Cormorants is afforded by the occurrence of another morphological variant, i.e. individuals with light blue instead of green or light brown irides (Fig. 1); these individuals were collected only in the eastern foothills of the Andes from southwestern Argentina to central Peru. Two of the 5 birds with blue irides also had 14 tail feathers, one of which was Wetmore's (1926) specimen.

The relatively high number of birds with extra rectrices from Islas Chinchas and the relatively restricted distribution of the other 14-rectrix birds suggests a simple genetic component to rectrix number, possibly analogous to that found in discrete plumage states (eg. 'bridling' in murrens—Jeffries & Parslow 1976), rather than a randomly occurring mutation. The co-occurrence of the 'blue-eye' variants in the same region with the '14-rectrix' variants suggest that gene flow between the southern population and the northern and Amazonian populations is low. If so, this argues against the notion that *P. olivaceus* is a single, panmictic, continent-wide race or species (eg. Blake 1977).

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